

REMARKS/ARGUMENTS

Reconsideration of this application is requested. Claims 1-25 are in the case.

Rejection under 35 USC 102(b)

Claims 1-6, 9-17, and 21-25 were rejected under 35 USC 102(b) as being anticipated by US Patent Number 4,128,518 (Oyamada et al.) It was argued that Oyamada et al. disclose the instantly claimed vinyl acetate emulsion obtained by the claimed method; but is silent regarding the claimed particle size and shear thinning factor. It was also argued, inter alia, that the polymer emulsions disclosed by Oyamada et al. would inherently possess the parameters of this invention because the ingredients and method steps fall within the scope of the claimed method.

Response to Rejection

As put forth on page 6 of the specification, under the heading detailed description of the invention, the present invention is based on the finding that the use of trace amounts of a chain transfer agent, i.e. very small amounts, surprisingly results in an increase of shear thinning factor without substantially changing the composition and average molecular weight of the latex. A conventional emulsion polymerization process is used for making vinyl acetate based polymer lattices in presence of a poly(vinyl alcohol) protective colloid. The emulsion polymerization, however, differs from the prior art, by carrying out the polymerization in the presence of trace amounts of chain transfer agent. These trace amounts are defined in independent claims 1, 16 and 22 of the present invention to be in the range of 0.0001-0.05 wt.% of chain transfer agent, based on total monomer weight.

Applicant agrees with the Examiner's analysis that Oyamada et al. disclose a conventional emulsion polymerization process for obtaining a vinyl acetate-ethylene co-polymer latex in presence of a protective colloid (PVOH) and a chain transfer agent. Applicant, however, disagrees with the Examiner's finding that all parameters of the emulsion polymerization process as disclosed in Oyamada et al. are identical to those of the present invention. Specifically, as discussed above, the invention process is distinguished from Oyamada et al. by use of trace amounts of the chain transfer agent. At column 5, lines 18 to 39, Oyamada et al. refer to conventional chain transfer agents, but is essentially silent on the

amount that is used. The only reference to amounts of chain transfer agent is in the examples. Calculated from parts by weight given in examples 1 through 4 of Oyamada et al., the amount of chain transfer agent is 0.39 wt.%, 0.16 wt.%, 0.79 wt.%, and 0.39 wt.%, respectively, based on total monomers. These are conventional amounts of chain transfer agents used in the prior art (above about 0.1 wt.%) and outside the claimed range of the present invention. It is submitted that identical conditions are not used by Oyamada et al., since the amount of chain transfer agent is much larger than those recited in claims 1-6, 9-17, and 21-25. Different amounts of chain transfer agent will result in a different product. This is confirmed by examples presented in the instant specification at Table 1, page 27. Comparing examples 9 and 10, in which 25 ppm and 45 ppm, respectively, of 3-mercaptopropionic acid (MPA) were used, to examples 12, 13 and 14, in which 180 ppm, 350 ppm and 720 ppm, respectively, of MPA were used, the K value was substantially reduced in examples 12, 13 and 14. This reduction in K value indicates a reduction in molecular weight.

Oyamada et al. therefore does not anticipate the subject matter of claims 1 to 6, 9 to 17, and 21 to 25. Withdrawal of the rejection under 35 U.S.C. 102 (b) is requested.

Rejection under 35 USC 103 (a)

Claims 1-25 were rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent Number 4,128,518 (Oyamada et al.). The Examiner essentially repeated the remarks made under the 102(b) rejection and added that it would have been obvious to one of ordinary skill in the art at the time of the invention to use the chain transfer agents of the instant claims because the patentee encompasses chain transfer agents generically. It was also argued that it would have been obvious to use the chain transfer agents in low amounts because even very low amounts of the chain transfer agent would be expected to give the desired lowering of molecular weight.

Response to Rejection

As discussed above, Oyamada et al. teach the use of chain transfer agent in conventional amounts. Use of conventional amount of chain transfer agent results in a material that is different than the material of the present invention. The use of trace amounts of chain transfer agents provides for surprising advantages, namely an increased shear

thinning factor at comparable molecular weight and at minimal changes to latex composition. This was completely surprising to the inventors.

Oyamada et al. do not discuss the amount of chain transfer agent to be used. This amount is, however, an essential part of the present invention. Accordingly, based on the disclosure of Oyamada et al., it would not have been obvious to the skilled artisan to reduce the amount of chain transfer agent compared to what was and is conventionally used in the art, in order to achieve the distinct advantages of an increased shear thinning factor at comparable molecular weight of the polymer latex. A *prima facie* case of obviousness has not therefore been shown with the disclosure of Oyamada et al.

In addition, data presented in the instant case and discussed above, rebut a *prima facie* obviousness rejection. It is shown in Table 1, page 27, of the specification that when small amounts of chain transfer agent (MPA) are used, molecular weight is maintained and K value is improved. For example, examples 9 and 10, in which 25 ppm and 45 ppm, respectively, of 3-mercaptopropionic acid (MPA) were used, the K value is substantial the same as example 8, in which no chain transfer agent was used. However, in examples 12, 13 and 14, in which 180 ppm, 350 ppm and 720 ppm, respectively, of MPA were used, the K value was substantially reduced, indicating a substantial reduction in average molecular weight. These results are unexpected.

Based on the above remarks, Claims 1-25 would not have been obvious, based on the disclosure of US Patent Number 4,128,518 (Oyamada et al.). In addition, data presented in the case rebut a *prima facie* obviousness rejection, based on the disclosure of Oyamada et al. The rejection of Claims 1-25 under 35 USC 103(a) should be withdrawn.

In view of the arguments made herein, it is believed that the application is in condition for allowance and should be passed to issue.

Respectfully submitted,

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